Title: Souper Soup

Brief Overview:

This lesson involves students in a variety of activities centering around beans and their use in preparing soup. Students will observe, discuss, and compute in cooperative groups as they complete activities in language arts, science, and math. At the conclusion, students will enjoy eating their soup and persuade the school cafeteria manager to offer soup on her menu.

Links to Standards:

- **Mathematics as Problem Solving**
  Students will demonstrate their ability to solve mathematical problems as they investigate data.

- **Mathematics as Communication**
  Students will demonstrate their ability to communicate mathematically in order to read and discuss cooperatively and to write to persuade.

- **Mathematics as Reasoning**
  Students will demonstrate the ability to reason mathematically as they manipulate data on beans and work with a recipe.

- **Mathematical Connections**
  Students will apply mathematical thinking as they connect data to its use in manipulating a given recipe.

- **Estimation**
  Students will recognize when an estimate is appropriate and apply estimation in their data.

- **Number Sense and Numeration**
  Students will count accurately and record data in appropriate locations.

- **Measurement**
  Students will estimate and verify measurement and will apply measurements to real-life situations.

- **Statistics and Probability**
  Students will demonstrate their ability to collect, organize, and display data and will then interpret this information.

- **Fractions and Decimals**
  Students will revise recipe and figure total and per serving cost.

Grade/Level:

Grades 4-6

Duration/Length:

9 class periods of 45-50 minutes each

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- attributes, properties, characteristics for classification
- bar graphs and line plots
- estimation and prediction
- sorting by observation
- persuasive letter writing

Objectives:

Students will:

- observe to collect information through the use of their senses.
- organize and display data.
- make and support predictions.
- classify by observing a particular property in order to sort objects into groups.
- support their position in a persuasive letter.
- read to perform a task.
- revise recipe to meet required amount needed.
- work in groups cooperatively.
- investigate sample to determine how they can be used to predict the total amount.
- classify objects according to observable characteristics that the objects have in common in order to make predictions.

Materials/Resources/Printed Materials:

- Stone Soup by Marcia Brown
- Package(s) of soup bean assortment (America's Choice Sixteen Bean Soup Mix was used for this task)
- Zip-loc bags
- Rulers
- "Souper" Sorting Chart for each group (Student Resource #1)
- "Souper" Bean Identification (Student Resource #2)
- "Souper" Identification Chart for each group (Student Resource #3)
- Individual Bar Graph (Student Resource #4) and Sample (Teacher Resource #1)

- Let's Sample Our Beans Worksheet (Student Resource #5)
- Cumulative Count Graph (Student Resource #6) and Sample (Teacher Resource #2)
- Beans A-Weigh Worksheet (Student Resource #7)
- Graph and line plot rubric (Teacher Resource #3)
- Overhead chart for cumulative graph (copy attached)
- Bean soup recipe (Student Resource #8)
- Writing prompt with rubric (Student Resource #9 with Teacher Resource #4)
- Price list for ingredients
- Chart paper
- Overhead projector

Development/Procedures:

Lesson 1 - Language Arts

- Read Stone Soup by Marcia Brown either all together orally to class.

- Discuss, "What makes soup?" List ingredients mentioned on board or chart. Emphasize how many different ingredients can be and are used in soup.

- Ask class why they think people started making soup. (Ingredients available, leftovers, feed many for little money, etc.)

- Discuss what children would like to use as ingredients if they were going to make soup.

- Have class write a note to you (teacher) telling what kind of soup they would like, what they would put in it and why.

Lesson 2 - Mathematics

- Refer to soup list and specifically zero in on beans.

- Discuss the reasons why beans have always been a much used ingredient in soup and other menu items. List on overhead or chart. Make sure to touch on following reasons.
    1. Non-perishable
    2. Nutritious
    3. Taste good
    4. Inexpensive
    5. Great variety available

- Divide class into groups of three or four.

- Pass out sorting chart, one for each group and 1/3 cup of bean assortment which has been pre-measured and put in Zip-loc bags.

- Discuss the fact that there will be subtle differences as well as major ones.

- Have groups sort like beans into circles, count number of beans in each circle and write that number inside that circle. Circulate around the room to make sure that sorting is being done correctly and facilitate where needed.

- Instruct groups to write one or two descriptors under each circle for the particular beans in that circle. Tape one of the beans inside the circle for further identification in science.

Lesson 3 - Science

- Use a warm-up to begin the class: List 2 ways that your math group used to classify your beans.

- Using the sorting chart from math, have the students identify each bean. They will need to look for the properties that will best help them in their identification. They will then tape their beans onto the "Souper" Bean Identification Chart.

Lesson 4 - Mathematics

- Review identifications done in science.

- Do individual bar graphs using data from group sorter sheet. Make bars with "X's" to show the number of each type of bean using attached graph format.

- Using data from individual graphs, have students make and write predictions about the contents of the whole package as to most and least kinds of beans.

Lesson 5 - Science

- Lead students in a discussion of random sampling using the worksheet called “Let’s Sample our Beans.”

Lesson 6 - Mathematics

- Ask for predictions made in lesson 4 and record on chart paper

- Have each group report as to data for their group and put on cumulative graphing chart (copy attached) on overhead. After each group is finished, have students look at results and decide whether or not they want to change their original predictions.

- Discuss and emphasize the fact that "more data is better" when making predictions and why.

- When the cumulative graph display is finished, discuss most and least and have students compare with their original estimates. Ask "Were you correct in your predictions?" "Why might someone be way off even though he was accurate in his sorting, identifying and counting?" (Size of sample, where and how sample was scooped, weight or size of beans dropping to bottom, etc.)

Lesson 7 - Science

- The class will find the mass of a sample of beans using the balance scale and weights, using the worksheet, Beans A-Weigh.

Lesson 8 - Mathematics

- Refer back to soup chart made at the beginning and story read. What was the old man's recipe? Did he only use stones?

- Pass out bean soup recipe. Read together and discuss what you would do to make soup for everyone. What would you have to know?

- When students find and relate how many servings one recipe makes, tell them that you want to serve ___ students (your choice according to how many you are teaching). Ask them to give some opinions as to what they should do next.

- Using input from students, revise the recipe and make a list of needs. Give students price list and have them figure individually what the cost would be of the items needed including food items and serving necessities such as bowls, spoons and napkins. Have group feedback and put on chart or overhead.

- Explain that this is total cost for whole group and discuss how we could find cost per person.

- After this lesson, teacher should boil/soak beans according to the recipe and bring back ready for cooking. Start beans cooking first thing in the morning and add ingredients as recipe dictates. (This is difficult to do as a class unless you have a kitchen available for your use.) Soup can be served last thing in the day.

Lesson 9 - Language Arts

- Hand out persuasive writing prompt. Review prompt together and highlight important requirements (**F**ormat, **A**udience, **T**opic, **P**urpose, **I**nformation, **G**raphic organizer).

- Review persuasive letter requirements and suggestions for support paragraphs.

- Have students write letter emphasizing correct format, grammar, sentence formation, punctuation, etc. MSPAP icons may be applied to prompt.

Performance Assessment:

Students will be assessed using a scoring rubric for a persuasive letter and a rubric for constructing a line graph. They also will be assessed by teacher observation and class and group participation.

Extension/Follow Up:

The Hateful Plateful Trick by Scott Corbett
Mama Don't Allow by Thacher Hurd
Let's Make Soup by Hannah Lyons Johnson
The Fairy Tale Cookbook by Carol MacGregor
Uncle Willie and the Soup Kitchen by Dyanne DiSalvo-Ryan
Button Soup by Doris Orgel

Other types of soups could be studied and connected to countries of origin and products readily available in that country or region.

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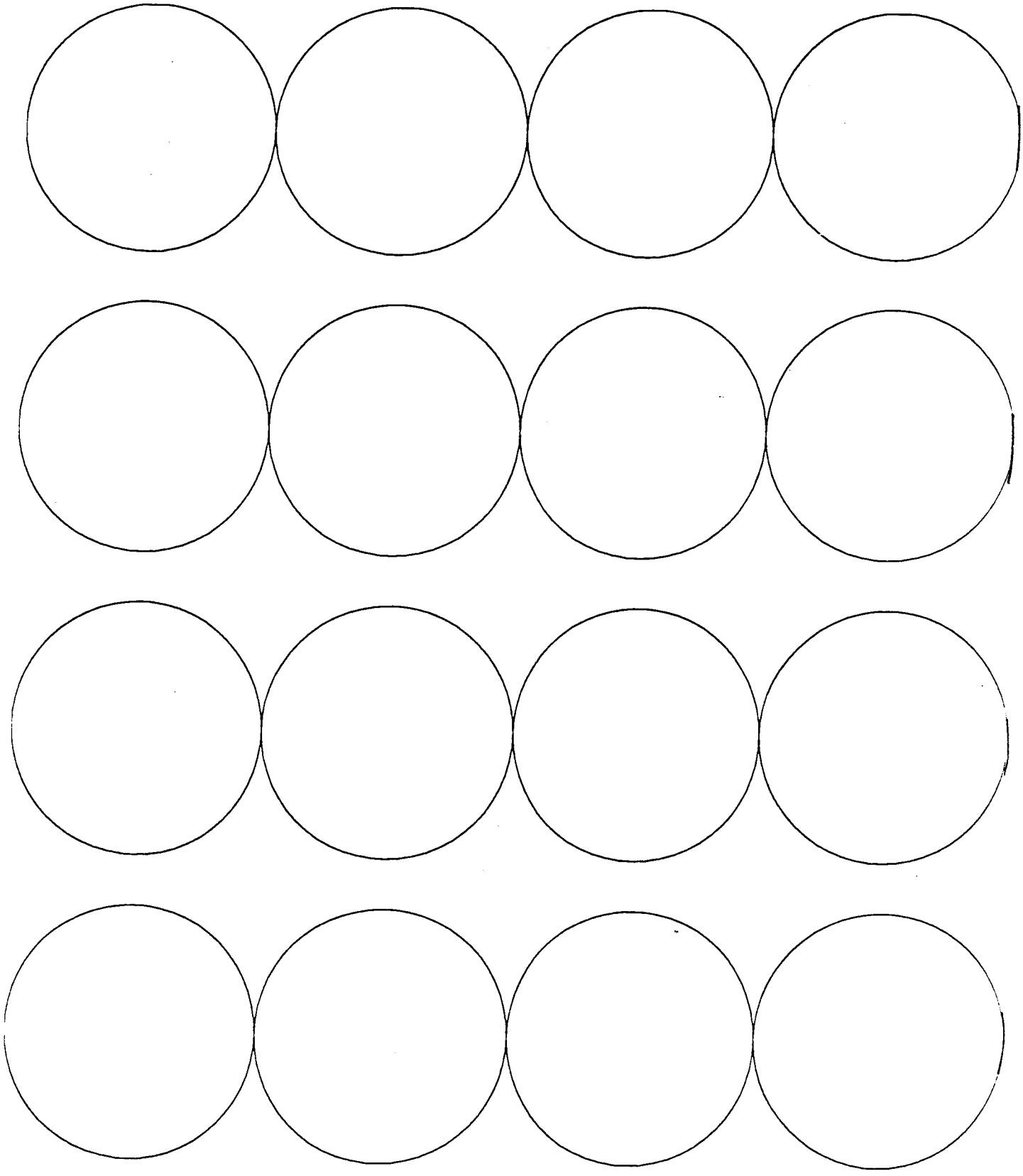
"SOUPER" BEAN SORTING CHART

Student Resource 1



"Souper" Bean Identification

Using your "Souper" Sorting Chart from math, identify each bean. Look for properties that will help you in your identification.

List some properties that can help you in your identification.

_____

_____

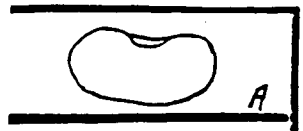
_____

_____

As you identify each bean, tape it to your "Souper" Bean Identification Chart.

"SOUPER" BEAN IDENTIFICATION CHART

Student Resource 3



REDDISH BROWN KIDNEY BEAN

MARBLE-LIKE LIGHT BROWN AND DARK BROWN

WHITE LARGE LIMA BEAN

WHITE OVAL SHAPED BEAN

CREAM COLOR WITH BLACK "EYE"

GREEN ROUND HALF-BEAN

GOLDEN YELLOW HALF-BEAN

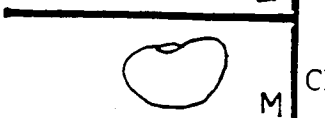
BLACK BEAN

GOLDEN BROWN BEAN

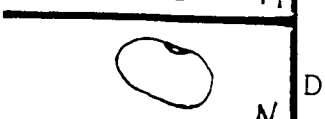
SMALL WHITE BEAN

LIGHT BROWN WITH REDDISH BROWN STRIPES

LIGHT BROWN SMALL FLAT BEAN WITH SOME BROWN SPOTS

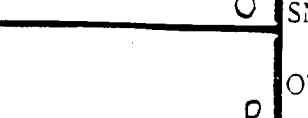


CREAMY WHITE MEDIUM LIMA BEAN

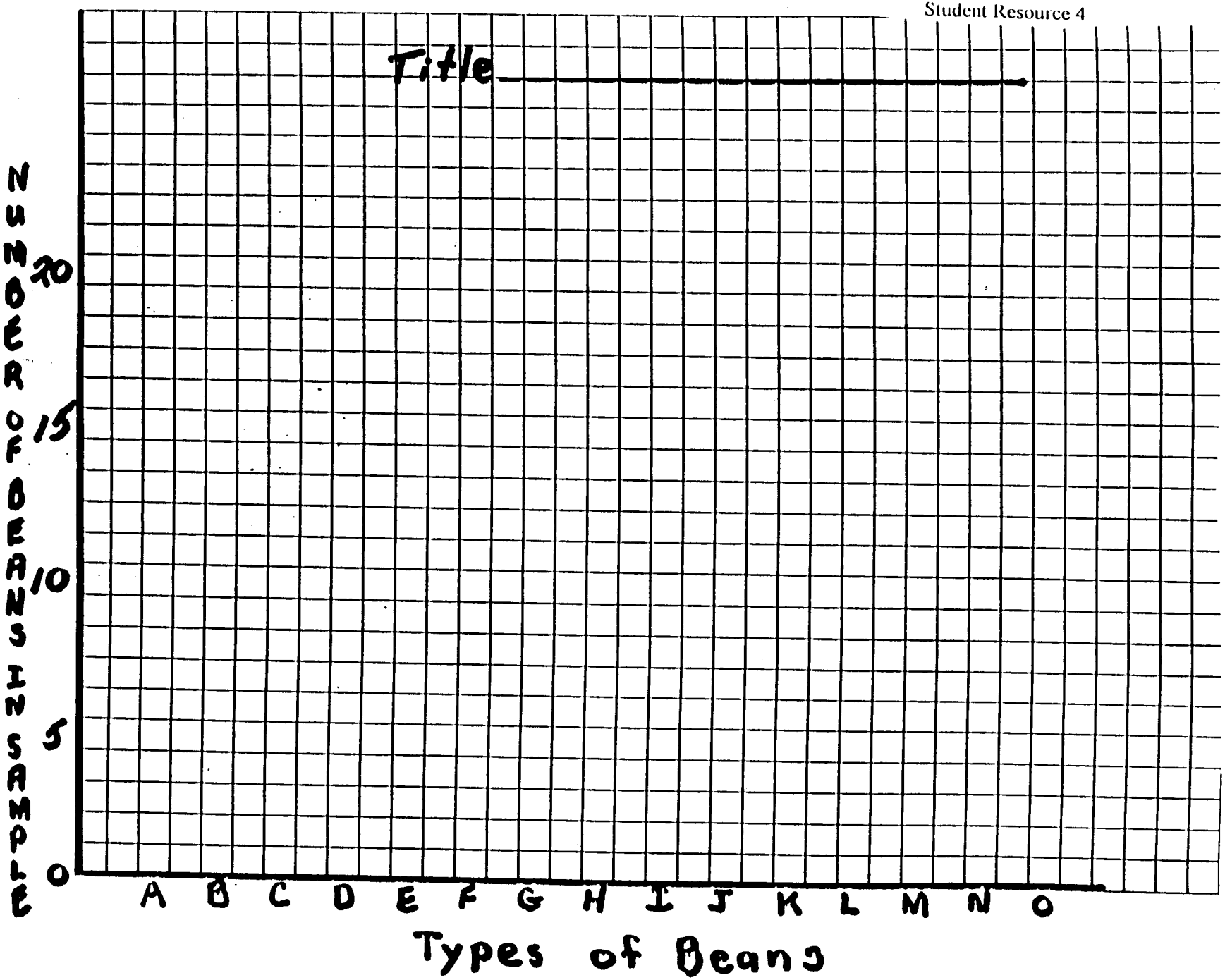


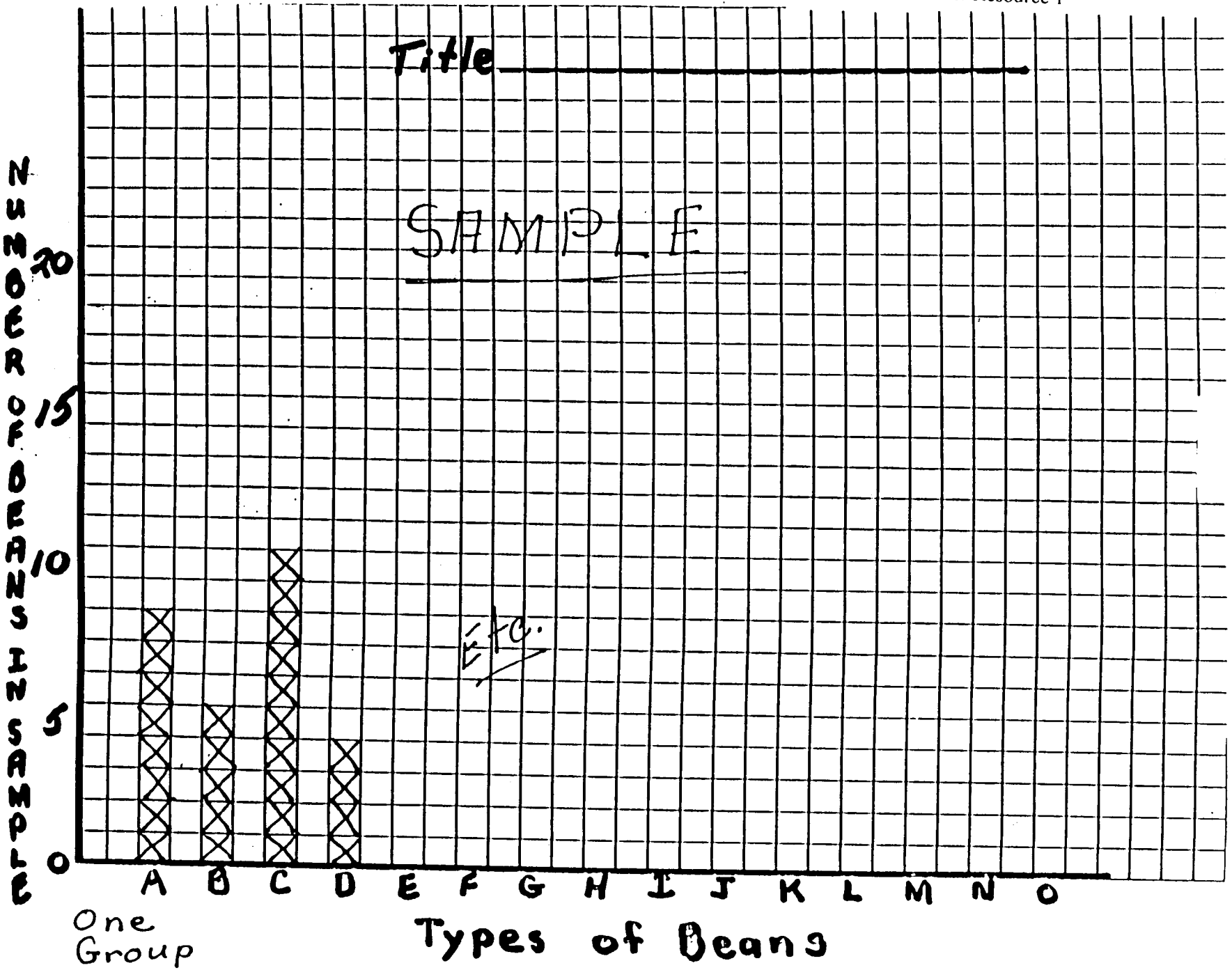
DARK RED BEAN WITH WHITE "EYE"

SMALL GRAYISH BROWN SOLID COLOR BEAN - LOOKS LIKE SMALL FLAT PEBBLE



OTHER


Title
NUMBER OF BEANS IN SAMPLE
0
5
10
15
20
A B C D E F G H I J K L M N O
Types of Beans


Title
SAMPLE
NUMBER OF BEANS IN SAMPLE
20
15
10
5
0
A B C D E F G H I J K L M N O
One Group
Types of Beans
etc.

Let's Sample Our Beans

Problem: Can we reasonably predict how many beans there are of each kind from drawing random samples?

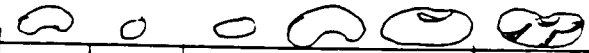
Random samples are widely used to draw conclusions about something. Zillions and Consumer Reports conduct random sample tests to determine the quality of products. A random sample is_____

Estimate how many of each kind of bean there are in the bag. Then estimate the total number of beans you think are in your bag.

Prediction: I think there will be more _____ beans than any other kind.
I think there will be fewer _____ beans than any other kind.
I think there are _____ beans altogether.

Procedure:

1. Without looking in the bag, pull out 6 beans.
2. Record the number of each kind of bean in the table below.
3. Return the beans to the bag and mix thoroughly before pulling the next sample out.
4. Repeat steps 1-3 three more times.

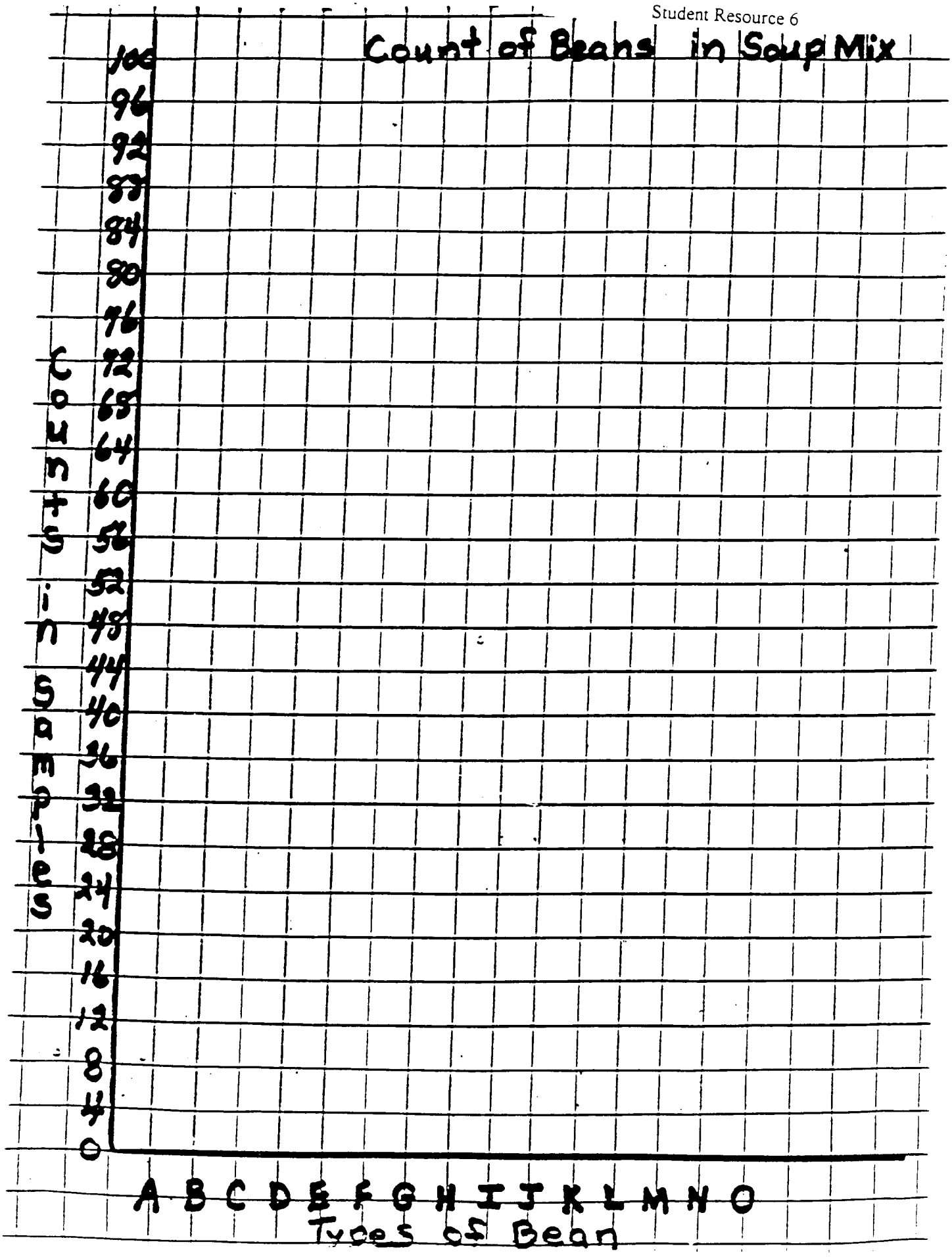


Sample # 1							
Sample #2							
Sample #3							
Sample #4							
Total of all samples							

4 Using the information from the table, predict how many beans there are in your bag.

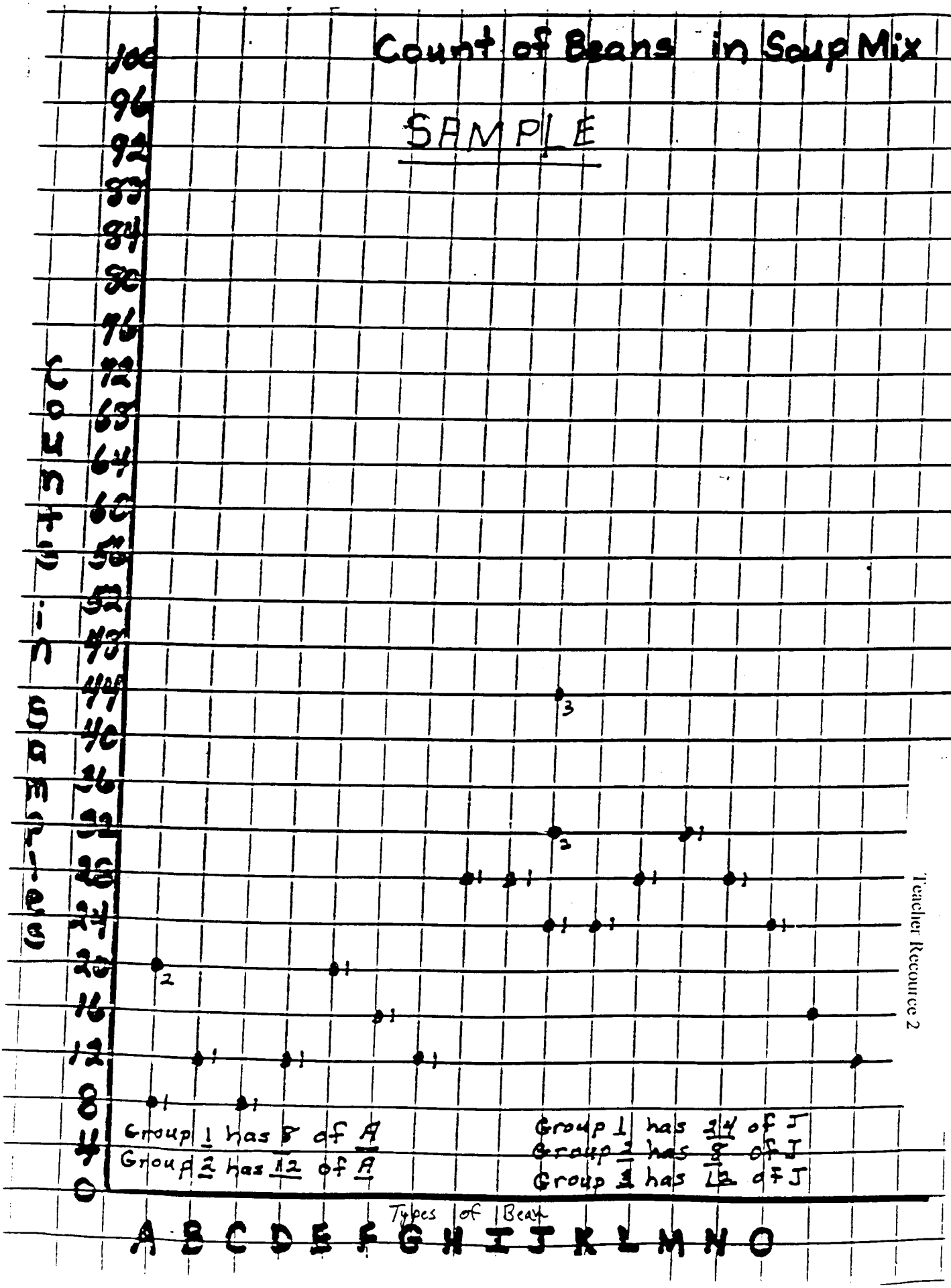
My prediction						
Actual Number						

Student Resource 6



Count of Beans in Soup Mix

SAMPLE



Beans A-Weigh

Problem: Can you find the mass of your beans using the balance and weights?

Procedure:

1. Predict the mass of your dry beans.

   I think our dry beans will have a mass of _____

2. Find the actual mass of your beans and record it. _____

Before making our soup, these beans must be soaked in water overnight. Discuss with your group what the purpose of this might be. Write a sentence telling why you think the beans need to be soaked.

_____

Now predict the mass of your beans. Will it change or stay the same?

_____

Find the mass of your soaked beans and record it. _____

Compare your predictions to the actual mass.

_____

Write a paragraph explaining what we did and what the results were.

_____
_____
_____
_____
_____
_____
_____

Find the mass of one reddish brown kidney bean. Fill in the table below.

Number of kidney beans	Mass (grams)
0	0
2	
4	
10	

Make a line plot of your results. Label your line, *kidney beans*.

Number of black beans	Mass (grams)
0	
2	
4	
10	

Record these results on the line plot. Label this line, *black beans*.

Using your graph, estimate the mass of 7 kidney beans. _____
Estimate the mass of 5 black beans. _____

What do you notice about your graph? _____

_____

_____

Teacher Resource 3

Scoring Rubric for Line Plot

4 points
- Includes an appropriate title
- Includes appropriate labels for the x and y axis
- Accurately plots points on the line plot

3 points
- Includes a title
- Includes appropriate labels for the x and y axis
- Plots points on the line plot with reasonable accuracy

2 points
- Includes a title
- Includes a label for either the x or y axis
- Data partially inaccurate

1 point
- Omits a title
- Labels x and y axis inaccurately or omits labels
- Data is inaccurate or is not displayed using a line plot

Teacher Resource 4

Scoring Rubric for Persuasive Letter

4 points

- Uses correct letter format
- Identifies a clear position and supports that position
- Effective language choices are used to influence intended audience
- Consistently uses correct grammar, mechanics, and spelling

3 points

- Uses correct letter format
- Identifies a clear position and partially supports that position
- Language choices are effective for influencing intended audience
- Uses correct grammar, mechanics and spelling with very few errors

2 points

- Omits one part of the friendly letter format
- Language choices are adequate for influencing intended audience
- Several errors observed in grammar, mechanics, and spelling
- Identifies a position and attempts to support that position

1 point

- Omits more than one part of correct letter format
- Fails to identify a position and to support that position
- Writing does not address the needs and characteristics of intended audience
- Infrequent use of correct grammar, mechanics, and spelling

Student Resource #8

Recipe for "Souper" Bean Soup using America's Choice Sixteen Bean Soup Mix

1 20 ounce package of America's Choice Sixteen Bean Soup Mix
2 quarts of water per package
1 large can (28 oz.) tomatoes
1 large onion
1 teaspoon chili powder
1 lemon
1 teaspoon salt
1/4 teaspoon pepper

Procedures:

1. Soak beans overnight or cover with water and bring to a boil. Boil for 3 minutes. Remove from heat, cover and set aside for at least 1 hour.

2. After soaking, discard the soak water, add 2 quarts of fresh water. Bring to a boil. Simmer slowly 2 ½ to 3 hours.

3. Add tomatoes, onion, chili powder, lemon, salt and pepper. Simmer 30 minutes more.

4. Add contents of Ham Flavor Packet contained in package and simmer for 10 more minutes.

5. Serve.

Recipe serves 12-14.

Calories 80 per serving
Fat Calories 0 per serving
Sodium 400 mg per serving
Protein 8 g per serving

Student Resource #9

Writing Prompt

After our discussions of soup, you decide that perhaps the school cafeteria should serve soup during the winter. Write a letter to Mrs. Clark, the cafeteria manager, and attempt to persuade her to add soup to her daily menu.

Remember to state your position and support it with statements and facts.

Now, on another sheet of paper, write a letter to Mrs. Clark to suggest that she include soup on her daily menu in your cafeteria.